speed light   power light   hard disk   drive bays   reset button
                             access light

diskette drive   power button

AC Inlet   AC outlet   K/B   COM1   PARALLEL
            I   MOUSE COM2   VGA
voltage switch

power light
speed light
hard disk access light

power button
reset button

optional drive bays

VGA
PARALLEL
COM2
COM1
MOUSE
Km

option slots

AC inlet
AC outlet\ voltage switch

Computer Specifications

CPU and Memory

32-bit CPU	Cyrix 486SLC-33 or SLC2-50 microprocessor
System speed	Fast and slow processor speeds available; fast is the speed of your processor and slow is 8 MHz
	Press Ctrl Alt - to select slow speed or Ctrl Alt + to select fast speed (use the - or + on the numeric keypad); default system speed selectable through SETUP
Memory	2MB, 4MB, or 8MB RAM standard on SIMMs; expandable to 16MB using 1MB or 4MB SIMMs; SIMMs must be tin-plated, 30-pin, 8-bit or 9-bit, fast-page mode type with access speed of 70ns
ROM	128KB Phoenix system BIOS, video BIOS, and SETUP program located in EPROM on main system board
Video RAM	At least 512KB DRAM on main system board; expandable to 1MB using four 4 x 256 DIP-type DRAM chips
Shadow RAM	Supports shadowing of system and video BIOS ROM into RAM
Memory relocation	Supports relocation of 128KB of memory from **A0000h** to BFFFFh
Cache	1KB of internal cache on processor
Math coprocessor	Cyrix 83S87-33 or 83S87-25
Clock/ calendar	Real-time clock, calendar, and 114 bytes of CMOS RAM socketed on main system board with built-in rechargeable NiCad battery backup

Controllers

Video	Cirrus Logic GD5424 high-speed super VGA local bus on-board controller; provides True Color support and resolutions up to 1280 x 1024 in 16 colors with 1MB of video RAM
Diskette	Controller on main system board supports up to two diskette drives or one diskette drive and one tape drive
Hard disk	IDE interface on main system board supports up to two IDE hard disk drives with built-in controller; BIOS provides hard disk auto-sensing function

Interfaces

Monitor	Video interface for fixed or multi-frequency monitor built into system board; 15-pin, D-shell connector
Parallel	One standard 8-bit parallel bidirectional interface built into main system board; 25-pin, D-shell connector
Serial	Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors
Keyboard	PS/2 compatible keyboard interface built into main system board; 6-pin, mini DIN connector
Mouse	PS/2 compatible mouse interface built into main system board; 6-pin mini DIN connector
Optional game port	Optional 10-pin game port interface on system board; can control joystick functions with the addition of a port connector
Option slots	**ActionPC:** Connector card with five 16-bit, ISA compatible expansion slots; three full-length and two half-length
	ActionTower: Connector card with five full-length, 16-bit, I/O expansion slots; ISA compatible
Speaker	Internal

Mass Storage

ActionPC:
Internal mount:
One 3½-inch wide, one-inch high drive
Externally accessible mounts:
One 3½-inch wide, one-inch high drive and two 5¼-inch wide, half-height drives

ActionTower:
Front internal mount:
One 3½-inch wide, half-height drive
Rear internal mounts:
Two 3½-inch wide, half-height drives or one 3½-inch wide, full-height drive
Externally accessible mounts:
Two 3½-inch wide, third-height drives and two 5¼-inch wide, half-height drives

Diskette drives	3.5-inch diskette drives, 720KB or 1.44MB storage capacity 5.25-inch diskette drives, 360KB or 1.2MB storage capacity Combination diskette drives: 3.5-inch, 1.44MB and 5.25-inch, 1.2MB

Hard disk drives	5¼-inch or 3½-inch form factor hard disk drive(s), up to half-height size; up to two drives supported by the internal IDE controller
Other devices	Half-height tape drive, CD-ROM drive, optical drive, or other storage device; 5.25-inch or 3.5-inch (mounting frames needed to mount a second 3.5-inch drive in the ActionPC)

Keyboard

Detachable, two-position height; 101 or 102 sculpted keys; countrydependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys

Mouse

Detachable, two-button, PS/2 compatible

SETUP Program

Stored in ROM; accessible by pressing F2 during boot

Physical Characteristics

Dimension	ActionPC	ActionTower
Width	16.8 inches (427 mm)	7.125 inches (181 mm)
Depth	15.8 inches (401 mm)	16.25 inches (413 mm)
Height	4.4 inches (112 mm)	13.25 inches (337 mm)
Weight	17 lb (7.7 kg)*	16.25 lb (7.4 kg)*

* With one diskette drive, without keyboard

Power Supply

Type	200 Watt, switchable, UL/TUV listed, fan-cooled
Input ranges	90 to 132 **VAC** 180 to 260 VAC
Maximum outputs	+5 **VDC** at 20 Amps, -5 VDC at 0.5 Amp, +12 **VDC at** 8 Amps, -12 VDC at 0.5 Amp
Frequency	47 to 63Hz
Cables	Two to main system board, five to mass storage devices; for more than five devices, Y cables can be installed on the existing cables

Environmental Requirements

Condition	Operating Range	Storage range
Temperature	41° to 90°F (5° to 32° C)	-4° to 140°F (-20° to 60° C)
Humidity (non-condensing)	20% to 90%	10% t0 90%
Altitude	-330 to 9,900 ft (-100 to 3.000 m)	-330 to 39,600 ft (-100 to 12.000 m)
Maximum wet bulb	68° F (20° C)	134° F (57° C)
Acoustical noise	46.2 dB	N/A

Major Subassemblies

The following diagrams illustrate the major subassemblies in the ActionPC and ActionTower systems.

ActionPC

option card
connector
board

microprocessor   J6-J9

J10-J12

J13, J14, J16

power
supply

J1-J5

SIMM sockets

video
memory
sockets

coprocessor
socket

J15

drive mounting
bracket

drive bays

ActionTower

coprocessor   video memory
socket   sockets

microprocessor

option card
connector
board

herd disk drive
mounting bracket

drive bays   SIMM sockets

poker
supply
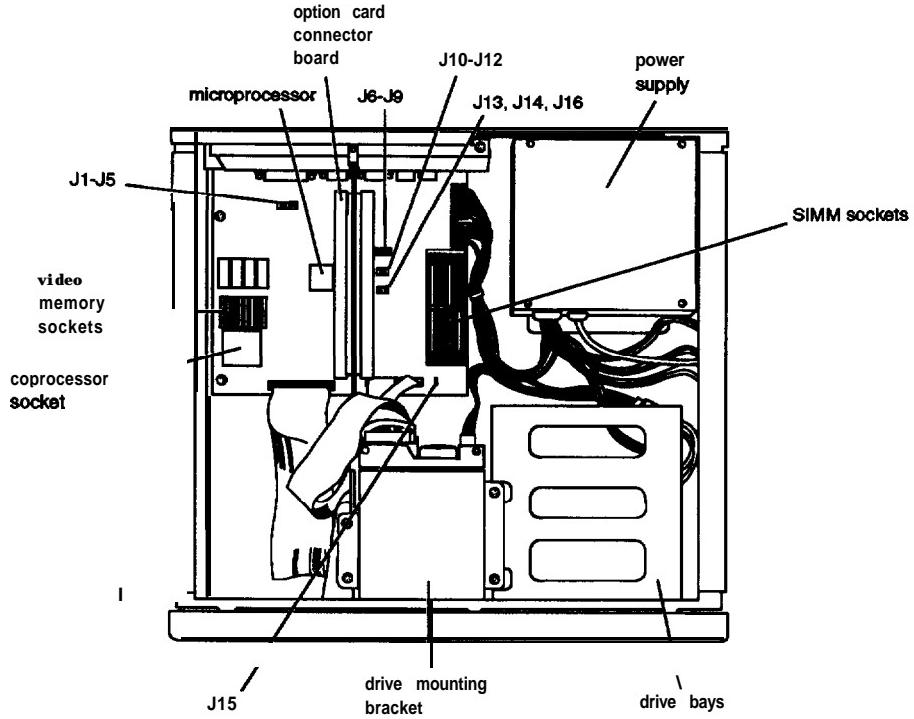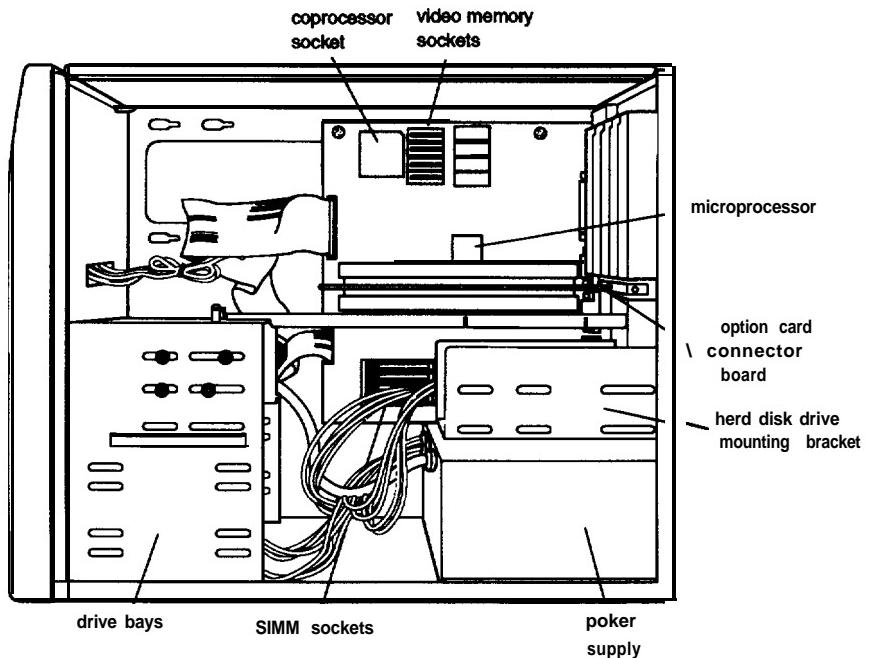
System Board Components

The diagram below illustrates the components on the ActionPC/ActionTower system board. The table following it describes these components.

```
┌─────────────────────────────────────────────────────────────────────┐
│         ┌──────┐  ┌──────────┐   ┌──────────┐                ┌──────┐ │
│         │ U13  │  │   U5     │                              │ CN4  │ │
│  CN12   ┌──────┐  ┌──────────┐   ┌──────────┐                └──────┘ │
│  CN13   │ U14  │  │   U6     │        ┌────────┐                      │
│         ┌──────┐  ┌──────────┐        │        │                      │
│  CN14   │ U15  │  │   U7     │        │   U3   │                      │
│         ┌──────┐  ┌──────────┐        │        │              ┌──────┐ │
│  CN15   │ U16  │  │   U8     │        └────────┘              │ CN5  │ │
│                                          J1-J5                         │
│  CN16   ┌──────────┐                                                   │
│         │   U27    │         ┌──────┐   ┌────────┐                     │
│         └──────────┘         │ U10  │   │   U4   │           ┌──────┐  │
│         ┌──────────┐         └──────┘   └────────┘    OSC1   │ CN6  │  │
│  CN18   │   U22    │                                         └──────┘  │
│         └──────────┘                                                   │
│ ┌───────────────────────── S1 ──────────────────────────┐             │
│                    J13 J10 J6                             ┌──────┐     │
│                    J14 J11 J7                        CN8  │ CN7  │     │
│  CN19              J16 J12 J8                             └──────┘     │
│         ┌──────────┐        ┌──────┐   ┌──────┐                        │
│         │   U23    │        │ U11  │   │  U2  │           ┌──────┐     │
│         └──────────┘        └──────┘   └──────┘           │ CN1  │     │
│  J15    ┌───────────────────┐               CN10          ┌──────┐     │
│         │      RAM1         │               CN9           │ CN2  │     │
│  BAT1   │      RAM2         │                                         │
│         │      RAM3         │        ┌──────────────┐                 │
│         │      RAM4         │        │    CN11      │                 │
└─────────────────────────────────────────────────────────────────────┘
```
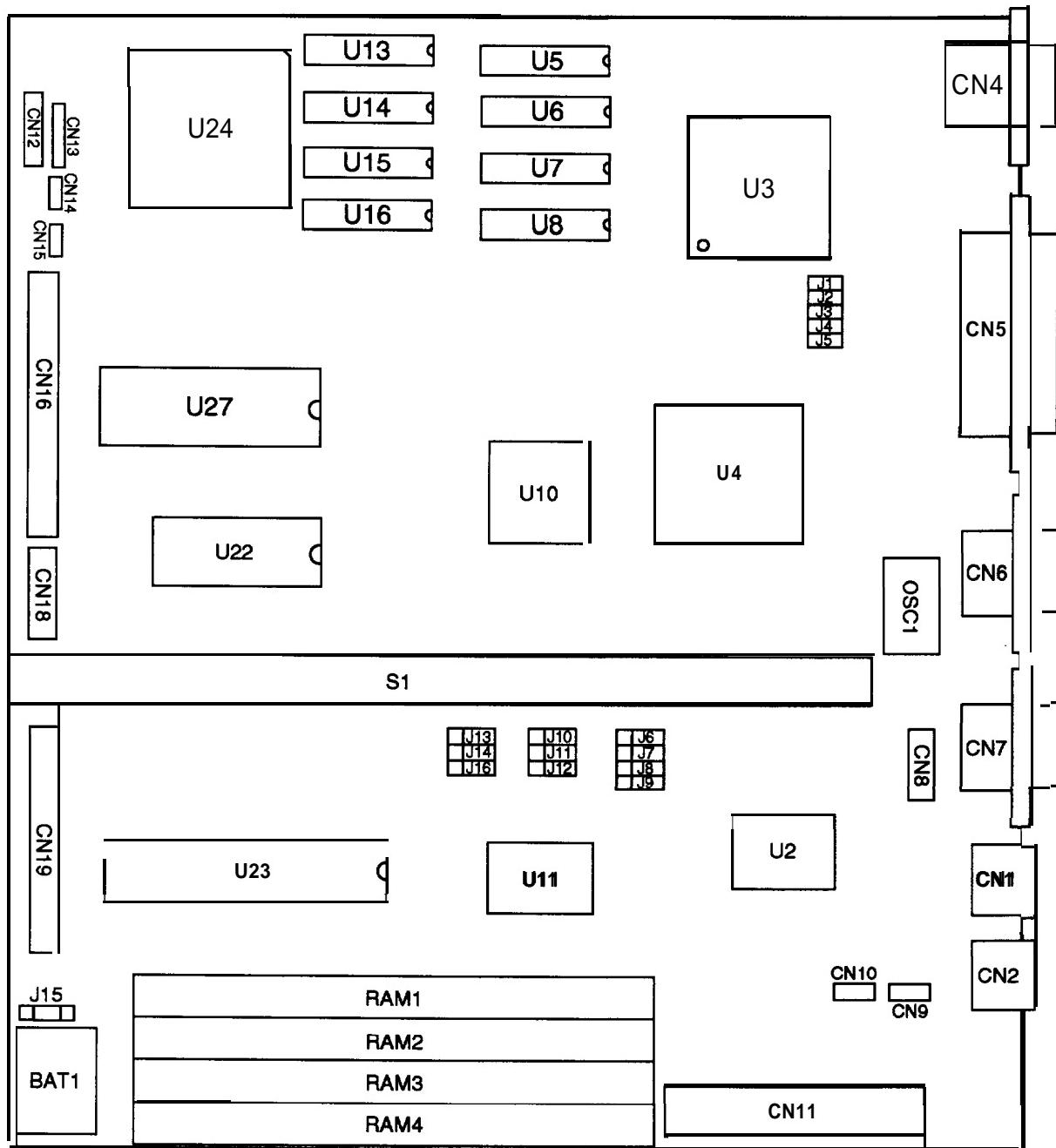
System bad components

Socket	Component
U2, U11	Super I/O controller (UMC82C863,865); supports up to two diskette drives, two serial ports. and one parallel Fort
U3	Cirrus GD5424 video controller; local bus VGA with TrueColor support
U4	ALI M1217 system and memory controller
U5, U6, U7, U8	Video DRAM
U10	Cyrix 486SLC-33/SLC2-50 processor
U13, U14, U15. U16	Socketed video DRAM
U22	Real-time clock controller
U23	Keyboard and mouse controller
U24	Math coprocessor socket
U27	Phoenix system and VGA BIOS
CN1	PS/2 Type mouse connector; 6-pin, mini-DIN
CN2	PS/2 type keyboard connector; 6-pin. mini-DIN
CN4	Video connector; 15-pin, D-shell, high density
CN5	Parallel port; 25-pin, D-shell
CN6	Serial port COM2; 9-pin, D-shell
CN7	Serial port COM1; 9-pin, D-shell
CN8	Game connector, 2-pin header
CN9, CN15	Reset connector; 2-pin header
CN10	Fan connector; 2-pin header
CN11	Power supply; 12-pin connector
CN12	Key-lock and power LED connector
CN13	Speaker connector; 4-pin header
CN14	Turbo switch connector, 2-pin header
CN18	Hard disk drive connector; 40-pin header
CN18	Hard disk drive, TURBO, and power LED connector: 6-pin header
CN19	Diskette drive connector; 34-pin header
S1	ISA 120-pin slot connector
RAM1,2,3,4	SIMM sockets; two banks of two sockets each
OSC1	Oscillator
BAT1	Battery

Jumper Settings

The following table lists the jumpers that can be changed; other jumpers are for factory use only.

Jumper settings

Jumper number	Jumper setting	Function
J3	1-2	Enables VGA IRQ
	OFF*	Disables VGA IRQ
J6	1-2 *	Enables COM1
	2-3	Disables COM1
J7	1-2"	Assigns COM1 serial port as COM1 (3F8H-3FFH)**
	2-3	Assigns COM1 serial port as COM3 (3E8H-3EFH)**
J8	1-2 *	Enables COM2
	2-3	Disables COM2
J9	1-2*	Assigns COM2 serial port as COM2 (2F8H-2FFH)**
	2-3	Assigns COM2 serial port as COM4 (2E8H-2EFH)**
J10	1-2 *	Enables parallel port
	2-3	Disables parallel port
J11	1-2*	Assigns parallel port as LPT1 (378H-37FH)**
	2-3	Assigns parallel port as LPT2 (278H-27FH)**
J12	1-2*	Enables game port
	2-3	Disables game port
J13	1-2 *	Enables diskette drive controller
	2-3	Disables diskette drive controller

Jumper settings (continued)

Jumper number	Jumper setting	Function
J14	1-2*	Enables the IDE hard disk drive controller
	2-3	Disables the IDE hard disk drive controller
J15	1-4	Selects external battery
	2-3 .	Selects the system board battery
	3-4	Discharges CMOS memory (this resets the SETUP values to their factory defaults)
J16	1-2*	Enables the IDE hard disk drive controller
	2-3	Disables the IDE hard disk drive controller

* Factory setting

** MS-DOS automatically reassigns parallel and serial ports. Check the MS-DOS manual for more information.

Built-in VGA jumper settings

Built-in VGA	J1	J2
Enable	1-2*	1-2*
Disable	Off	Off

*Factory setting

SIMM Installation

Your computer comes with 2MB, 4MB, or 8MB of memory on memory mod&s-also called SIMMs (single inline memory modules). By installing additional SIMMs, you can increase the amount of memory in your computer up to 16MB.

There are four SIMM sockets on the main system board, and each can contain one SIMM. You can use 1MB and 4MB SIMMs.

The following table shows the possible SIMM configurations; do not install memory in any other configuration. The label on the system board for each SIMM socket (RAM1 through RAM4) identifies the bank of sockets where you should install SIMMS.

Possible SIMM configurations

BANK 0 (RAM1 and RAM2)	BANK 1 (RAM3 and RAM4)	Total memory
1MB	x	2MB
1MB	1MB	4MB
4MB	x	8Ms
4MB	4MB	18MB

Video Memory

The computer may come with 512KB or 1MB of video memory. You can increase the video memory to 1MB by installing four video DRAM DIP (Dual Inline Package) chips (44256), 70ns.

For the memory to work properly, you must install one chip in each socket.

Resolutions and colors

Resolution I	Memory requirements	Color	Refresh rates(Hz)	Remarks
640X480	512KB	256	60/72	8 bits/pixel
	1MB	32K/64K	60/72	18 bits/pixel
	1MB	16.7M (True color)	60/72	24 bits/pixel
800x600	512KB	256	56/60/72	8 bits/pixel
	1MB	32K/64K	56/60/72	18 bits/pixel
1024x768	512KB	16	43.5/60/70/72	4 bits/pixel
	1MB	256	43.5/60/70/72	8 bits/pixel
1280 x 1024	1MB	16	43.5	4 bits/pixel

Hard Disk Drive Types

Your computer comes with a hard disk auto-sensing feature. When you select *AUTO* DETECT 1 or 2 for your hard disk type in SETUP, the system detects the type of hard disk drive you have installed and fills in the drive information using values in the following table.

Hard disk drive types

Type	Size* (MB)	Cylinders	Heads	Sectors/track	Landing zone	Write precomp	Drive name
1	61	903	4	46	903	0	CP30084E
2	116	762	6	39	762	0	CP30104H
3	102	1024	12	17	1024	0	ST3123A
4	62	940	8	17	615	300	
5	46	940	6	17	940	512	
6	162	903	8	46	903	0	CP30174E
7	163	332	16	63	332	0	CP30174
8	204	1024	12	34	1024	0	ST3243A
9	112	Iam	15	17	901	0	
10	325	768	14	62	768	0	ST3390A
11	504	1024	16	63	1024	0	ST3655A
12	49	855	7	17	855	-1	
13	162	1010	6	55	1010	0	AC1170
14	244	1010	9	55	1010	0	AC2250
16	325	1010	12	55	1010	0	AC2340
17	202	989	12	35	989	0	AC1210
18	203	685	16	38	685	0	CFS210A
19	62	1024	7	17	1023	512	
20	30	733	5	17	732	300	
21	122	919	16	17	919	0	ELS127A
22	30	733	5	17	733	300	
23	162	1011	15	22	1011	0	ELS170A
24	234	723	13	51	723	0	LPS240A
25	240	895	10	55	895	0	CP30254
26	327	665	16	63	665	0	CP30344
27	515	1048	16	63	1048	0	CFA540A, AC2540
28	406	826	16	63	826	0	CFS420A
29	125	1002	8	32	1002	0	7131A
30	234	967	16	31	967	0	7245A
31	329	790	15	57	790	0	7345A
32	40	809	6	17	809	128	
33	48	830	7	17	830	0	
34	68	830	10	17	830	0	
35	42	1024	5	17	1024	0	
36	68	1024	8	17	1024	0	
37	40	615	8	17	615	128	
38	104	1024	8	26	1024	0	
39	69	925	9	17	925	0	
40	76	1024	9	17	1023	0	

Hard disk drive types (continued)

Type	Size* (MB)	Cylinders	Heads	Sectors/track	Landing zone	Write precomp	Drive name
41	114	918	15	17	917	0	
42	124	1001	15	17	1001	0	ST3145A
43	136	823	10	34	822	0	
44	Auto-detect 1						
45	Auto-detect 2						
46	User-defined 1						
47	User-defined 2						

* Actual formatted size may be slightly different from size on drive label; you cannot change this value.

Drive Option Information

Hard disk drive options for I-inch IDE drives

Parameters	Conner®							Quantum®		Western Digital®		
	CP-30084E	CP-30104H	CP-30174E	CP-30254	CP-30344	CFS420A	CFA540A	ELS170AT	LPS240AT	AC1170	AC2250	AC2340
Formatted capacity (MB)	85	120	170	250	340	420	540	170	245	170	240	340
Size, width × height (in)	4×1	4×1	4×1	4×1	4×1	4×1	4×1	4×1	4×1	3.5×1	3.5×1	3.5×1
Weight (lbs)	1.3	1.3	1.3	1.2	1.2	1.16	1.16	0.91	1.05	1.12	1.12	1.12
Cylinders	1806	1524	1806	1895	2116	2388	2805	1536	1818	2233	2233	2233
Disks	1	2	2	2	2	2	2	2	2	1	2	2
Heads	2	4	4	4	4	4	4	4	4	2	3	4
Sectors per track	46	39	46	62	63-95	63-100	72-114	54	44-87	56-96	56-96	56-96
Rotational speed (RPM)	3822	3399	3833	4542	4500	3600	4500	3663	4306	3322	3322	3322
Buffer size (KB)	32	32	32	64	64	32	256	32	256	64	64	128
Average seek time (ms)	17	<19	17	14	13	14	12	17	16	<13	<13	<13
Encoding method	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7
Power dissipation (seek)	3.75W	3.9 W	3.75W	3.75W	3.75W	5-12 W	5.7 W	4.0 W	4.9 W	5.2 W	5.2 W	5.2 W
Logical parameters												
Cylinders	903	762	903	895	655	826	1048	1011	723	1010	1010	1010
Heads	4	8	8	10	16	16	16	15	13	6	9	12
Precomp zone	0	0	0	0	0	0	0	none*	none*	1011	1011	1011
Landing zone	903	762	903	895	655	1048	1048	1011	723	1011	1011	1011
Sectors	46	39	46	55	63	63	63	22	51	55	55	55

* Select 1 or none for the precomp value. If neither of these options are available, select the maximum available precomp value.

IDE hard *disk drive jumper* settings

Model number	Single drive	Master drive	Slave drive
Conner CP30084E	C/D jumpered	C/D jumpered	No jumpers
Conner CP30104H	C/D jumpered	C/D, DSP jumpered	No jumpers
Conner CP30174E	C/D jumpered	C/D jumpered	No jumpers
Conner CP30254	C/D jumpered	C/D jumpered	No jumpers
Conner CP30344	C/D jumpered	C/D jumpered	No jumpers
Conner CFA540A	C/D jumpered	C/D jumpered	No jumpers
Quantum ELS170AT	DS jumpered	DS, SP jumpered or DS jumpered	No jumpers
Quantum LPS240AT	DS jumpered *	SP and DS jumpered *	No jumpers *
Western Digital AC1170	No jumpers	MA jumpered	SL jumpered
Western Digital AC2250	No jumpers	MA jumpered	SL jumpered
Western Digital AC2340	No jumpers	MA jumpered	SL jumpered

* CS (cable selection) can also be jumpered for any configuration. When CS is used, the drive is a master it pin 28 is grounded or a slave If pin 28 is not grounded.

Diskette and magneto-optical drive specifications

Parameters	EPSON SMD-349 diskette drive	EPSON S0880-002 combination diskette drive	EPSON OMD-5010 magneto-optical drive
Storage capacity	1474KB (formatted)	1474KB/1229KB	128MB
Size, width × height (in)	3.5 × 1	5.8 × 1.65	4.0 × 1.6
Cylinders	80	80	10,000
Heads	2	2	R/W laser
Tracks	160	160	10,000
Track density	135 tpi	135 TPI/96 TPI	15,875 TPI
Power on ready time	< 0.5 sec	500 ms	3.5/5.0 ms
Setting time	15 ms	15ms	N/A
Average latency time	100 ms	100 ms/83 ms	8.3 ms

DMA Assignments

Level	Assigned device
DMA0	Available (8-bit)
DMA1	Available (8-bit)
DMA2	Diskette drive controller (8-bit)
DMA3	Available (8-bit)
DMA4	Cascade for DMA2
DMA5	Available (16-bit)
DMA6	Available (16-bit)
DMA7	Available (16-bit)

Hardware Interrupts

IRQ no.	Function
IRQ0	Timeout 0 (internal connection)
IRQ1	Keyboard
IRQ2	Cascade IRQ 9
IRQ3	Serial port 2
IRQ4	Serial port 1
IRQ5	Parallel port 2
IRQ6	Diskette drive controller
IRQ7	Parallel port 1
IRQ8	Real-time clock
IRQ9	Available
IRQ10	Available
IRQ11	Available
IRQ12	PS/2 mouse
IRQ13	Math coprocessor
IRQ14	Hard disk drive controller
IRQ15	Available

System Memory Map

Address		Marker
000FFFFFFh	Memory to relocate BIOS	16MB (maximum system memory)
000FF0000h		
	Extended memory	
00100000h		1MB
000F0000h	System BIOS ROM	
	Available	
000C8000h		
000C0000h	VGA BIOS ROM	
	Display memory	
000A0000h		640KB
	640KB conventional system memory	
00000000h		

System I/O Address Map

Hex address	Assigned device
000-01F	DMA controller 1,8237
020-03F	Interrupt controller 1,8259
022-024	All M1217 configuration register
040-05F	Timer, 8254
060-06F	Keyboard and mouse controller, 8042
070 - 07F (CMOS)	Real-time clock NMI (non-maskable interrupt) mask
080 - 09F	DMA page register, 74LS612
0A00 - 0BF	Interrupt controller 2, 8259
0C0 - 0DF	DMA controller 2, 8237
0F0	Clear math coprocessor
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
1F0 - 1F8	Hard disk
200 - 207	Game I/O
278 - 27F	Parallel printer port 2
2B0 - 2DF	Alternate enhanced graphics adapter
2E1	GPIB (adapter 0)
2E2, 2E3	Data acquisition (adapter 0)
2F8 - 2FF	Serial port 2
300 - 31F	Prototype card
360 - 363	PC network (low address)
368 - 36B	PC network (high address)
378 - 37F	Parallel printer port 1
380 - 38F	SDLC, bisynchronous 2
390 - 393	Cluster
3A0 - 3AF	SDLC, bisynchronous 2
3B0 - 3BF	Monochrome display and printer port
3C0 - 3CF	Enhanced graphics adapter
3D0 - 3DF	Color graphics monitor adapter
3F0 - 3F7	Diskette drive controller
3F8 - 3FF	Serial port 1
6E2, 6E3	Data acquisition (adapter 1)
790 - 793	Cluster (adapter 1)
AE2, AE3	Data acquisition (adapter 2)
B90, B93	Cluster (adapter 2)
EE2, EE3	Data acquisition (adapter 3)
1390 - 1393	Cluster (adapter 3)
22E1	GPIB (adapter 1)
2390 - 2393	Cluster (adapter 4)
42E1	GPIB (adapter 2)
63E1	GPIB (adapter 3)
82E1	GPIB (adapter 4)
A2E1	GPIB (adapter 5)
C2E1	GPIB (adapter 6)
E2E1	GPIB (adapter 7)

Connector Pin Assignments

Parallel port connector pin assignments (CN5)

Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe	10	ACK *	19	Ground
2	Data 0	11	Busy	20	Ground
3	Data 1	12	PE	21	Ground
4	Data 2	13	Select	22	Ground
5	Data 3	14	Auto feed*	23	Ground
6	Data 4	15	Error*	24	Ground
7	Data 5	16	Init*	25	Ground
8	Data 6	17	Selectin *		
9	Data 7	18	Ground		

*Active low logic

Serial port connector pin assignments (CN6 and CN7)

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Ground		

Mouse and keyboard connector pin assignments (CN1 and CN2)

Pin	Signal	Pin	Signal
1	Data	4	VCC
2	NC	5	Clock
3	Ground	6	NC

VGA port connector pin assignments (CN4)

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	6	Red ground	11	NC
2	Green	7	Green ground	12	Monitor detect
3	Blue	8	Blue ground	13	Horizontal sync
4	NC	9	NC	14	Vertical sync
5	Ground	10	Ground	15	NC

Game port connector pin assignments (CN8)

Pin	Signal	Pin	Signal
1	VCC	6	Position 1
2	Button 0	7	Button 1
3	Position 0	8	VCC
4	Ground	9	VCC
5	Ground	10	NC

Power supply connector pin assignments (CN11)

Pin	Signal	Pin	Signal
1	Power good	7	Ground
2	+5VDC	8	Ground
3	+12 VDC	9	-5VDC
4	-12VDC	10	+5VDC
6	Ground	12	+5VDC

Diskette drive connector pin assignments (CN19)

Pin*	Signal	Pin*	Signal
2	NC	20	Step pulse
4	NC	22	Write data
6	NC	24	Write enable
8	Index	26	Track 0
10	Motor A	28	Write protect
12	Drive B	30	Read data
14	Drive A	32	Select header 0
16	Motor B	34	Disk change
18	Direction		

. All odd-numbered pins are grounds

Hard disk drive connector pin assignments (CN16)

Pin	Signal	Pin	Signal	Pin	Signal
1	RESET*	15	D1	29	NC
2	Ground	16	D14	30	Ground
3	D7	17	D0	31	IRQ14
4	D8	18	D15	32	IOCS16*
5	D6	19	Ground	33	A1
6	D9	20	NC	34	NC
7	D5	21	NC	35	A0
8	D10	22	Ground	36	A2
9	D4	23	IOW*	37	CS0*
10	D11	24	Ground	38	CS1*
11	D3	25	IOR*	39	Active*
12	D12	26	Ground	40	Ground
13	D2	27	IOCHRDY*		
14	D13	28	BALE		

*Active low logic

Speaker connector pin assignments (CN13)

Pin	Signal	Pin	Signal
1	+5VCD	3	NC
2	NC	4	Speak

LED connector pin assignments (CN18)

Pin	Signal	Pin	Signal
1	HDD LED (+)	4	Turbo LED (-)
2	HDD LED (-)	5	Power LED (+)
3	Turbo LED (+)	6	Power LED (-)

SIMM sockets (RAM1,2,3,4)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	Ground	19	NC	37	DP1	55	DQ11
2	DQ0	20	DQ4	38	DP3	56	DQ27
3	DQ16	21	DQ20	39	Ground	57	DQ12
4	DQ1	22	DQ5	40	CAS0*	58	DQ28
5	DQ17	23	DQ21	41	CAS2*	59	VCC
6	DQ2	24	DQ6	42	CAS3*	60	DQ29
7	DQ18	25	DQ22	43	CAS1*	61	DQ13
8	DQ3	26	DQ7	44	RAS0*	62	DQ30
9	DQ19	27	DQ23	45	RAS1*	63	DQ14
10	VCC	28	A7	46	A10A	64	DQ31
11	NC	29	NC	47	WE*	65	DQ15
12	A0	30	VCC	48	A10B	66	NC
13	A1	31	A8	49	DQ8	67	PD1
14	A2	32	A9	50	DQ24	68	PD2
15	A3	33	RAS3*	51	DQ9	69	PD3
16	A4	34	RAS2*	52	DQ25	70	PD4
17	A5	35	DP2	53	DQ10	71	NC
18	A6	36	DP0	54	DQ26	72	Ground

. Active low logic

Option card riser board connector pin assignments (S1)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A1	+12 VDC	A31	SA3	B1	+12 VDC	B31	BALE
A2	Ground	A32	SA2	B2	+5 VDC	B32	+5 VDC
A3	Ground	A33	SA1	B3	Ground	B33	OSC
A4	IOCHCK*	A34	SA0	B4	Ground	B34	Ground
A5	SD7	A35	Ground	B5	RESETDRV	B35	Ground
A6	SD6	A36	Ground	B6	+5 VDC	B36	+5 VDC
A7	SD5	A37	+5VDC	B7	IRQ9	B37	+5 VDC
A8	SD4	A38	SBHE*	B8	5 VDC	B38	MEMCS16*
A9	ISD3	A39	LA23	B9	DRQ2	B39	IOCS16*
A10	SD2	A40	LA22	B10	12 VDC	B40	IRQ10
A11	SD1	A41	LA21	B11	OWS*	B41	IRQ11
A12	SD0	A42	LA20	B12	+12 VDC	B42	IRQ12
A13	IOCHRDY	A43	LA19	B13	Ground	B43	IRQ15
A14	AEN	A44	LA18	B14	SMEMW*	B44	IRQ14
A15	SA19	A45	LA17	B15	SMEMR*	B45	DACK0*
A16	SA18	A46	MEMR*	B16	IOW*	B46	DRQ0
A17	SA17	A47	MEMW*	B17	IOR*	B47	DACK5*
A18	SA16	A48	SD8	B18	DACK3*	B48	DRQ5
A19	SA15	A49	SD9	B19	DRQ3	B49	DACK6*
A20	SA14	A50	SD10	B20	DACK1*	B50	DRQ6
A21	SA13	A51	SD11	B21	DRQ1	B51	DACK7*
A22	SA12	A52	SD12	B22	REFRESH*	B52	DRQ7
A23	SA11	A53	SD13	B23	SYSCLK	B53	+5 VDC
A24	SA10	A54	SD14	B24	IRQ7	B54	MASTER*
A25	SA9	A55	SD15	B25	IRQ6	B55	Ground
A26	SA8	A56	Ground	B26	IRQ5	B56	Ground
A27	SA7	A57	Ground	B27	IRQ4	B57	Ground
A28	SA6	A58	Ground	B28	IRQ3	B58	+5 VDC
A29	SA5	A59	+5 VDC	B29	DACK2*	B59	+5 VDC
A30	SA4	A60	+5 VDC	B30	TC	B60	+5 VDC

*Active low logic

Option slot connector pin assignments

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A1	IOCHCK*	A26	SA5	B20	SYSCLK	C14	SD11
A2	SD7	A27	SA4	B21	IRQ7	C15	SD12
A3	SD6	A28	SA3	B22	IRQ6	C16	SD13
A4	SD5	A29	SA2	B23	IRQ5	C17	SD14
A5	SD4	A30	SA1	B24	IRQ4	C18	SD15
A6	SD3	A31	SA0	B25	IRQ3	D1	Memcs16*
A7	SD2	B1	Ground	B26	DACK2*	D2	IOCS16*
A8	SD1	B2	RESETDRV	B27	T/C	D3	IRQ10
A9	SD0	B3	+5 VDC	B28	BALE	D4	IRQ11
A10	IORDY	B4	IRQ9	B29	+5 VDC	D5	IRQ12
A11	AEN	B5	5 VDC	B30	OSC	D6	IRQ15
A12	SA19	B6	DRQ2	B31	Ground	D7	IRQ14
A13	SA18	B7	12 VDC	C1	SBHE*	D8	DACK0*
A14	SA17	B8	OWS*	C2	SA23	D9	DREQ0
A15	SA16	B9	+12 VDC	C3	SA22	D10	DACK5*
A16	SA15	B10	Ground	C4	SA21	D11	DREQ5
A17	SA14	B11	SMEMW*	C5	SA20	D12	DACK6*
A18	SA13	B12	SMEMR*	C6	SA19	D13	DRQ6
A19	SA12	B13	IOW*	C7	SA18	D14	DACK7*
A20	SA11	B14	IOR*	C8	SA17	D15	DREQ7
A21	SA10	B15	DACK3*	C9	MEMR*	D16	+5 VDC
A22	SA9	B16	DREQ3	C10	MEMW*	D17	MASTER*
A23	SA8	B17	DACK1*	C11	SD8	D18	Ground
A24	SA7	B18	DREQ1	C12	SD9		
A25	SA6	B19	REF*	C13	SD10		

*Active low logic

Tested Operating Environments

Although your system will run most software applications, the following operating environments have been tested for compatibility with your system.

Microsoft MS-DOS 3.1 and later
Novell DR DOS
Novell NetWare* 2.2,3.12, and 4.01
Novell NetWare Lite
IBM OS/2
SCO UN-IX
SCO Open Desktop
Microsoft Windows 3.0 and later
Microsoft Windows for WorkGroups
Microsoft Windows NT

*Certified as workstation

Your system has also been Novell tested and approved. **As** new environments become available, these also will be tested.

Installation/Support Tips

Installing Diskette Drives

❏ Make sure that the drive type has been correctly selected in the SETUP program.

❏ Make sure jumper J13 is set to position 1-2 to enable the diskette drive controller.

Installing Hard Disk Drives

❏ If you are installing a drive that cannot use the embedded IDE interface, such as an ESDI hard disk drive, it is recommended that you use a 16-bit, AT-type hard disk controller. If you install a non-IDE hard disk drive and controller card, you must set jumpers J14 and J16 to position 2-3 to disable the built-in IDE hard disk drive interface. Also be sure to remove the hard disk drive ribbon connector from the system board.

❏ When installing a hard disk drive, see the hard disk drive type tables on pages 6 and 7 and use the auto-sensing feature in SETUP to select the correct type number for the drive. If the auto-sensing feature does not produce a match for the drive, you can define your own drive type by selecting User **Def 1** or User **Def 2** as the type and entering the drive's exact parameters.

Software Problems

❏ When installing a copy-protected software package, first try the installation at high speed. If this does not work properly, select low speed by pressing Ctrl Alt - (using the numeric keypad). Try loading the program at low speed and then switching to high speed, if possible.

❏ When running a software package that uses a key disk as its copy-protection method, try loading it at high speed. If this does not work, load it at low speed.

Installing Option Cards

Cl If you are installing a video adapter card that doesn't support VGA, make sure you disable the built-in VGA by removing jumpers J1 and J2.

COM Port Assignment

❏ If you want to assign COM1 as COM3, you must set jumper J7 to position 2-3. If you want to assign COM2 as COM4, you must set jumper J9 to position 2-3.

Information Reference List

Engineering Change Notices

None.

Technical Information Bulletins

None.

Product Support Bulletins

None.

Related Documentation

TM-ACTPC1520	EPSON ActionpC 1500/2000, ActionTower 2000 Service Manual
PL-ACTPC1520	EPSON ActionPC 1500/2000, ActionTower 2000 Parts Price List
400311100	EPSON Action 2000 User's Guide
400311200	EPSON **ActionPC** 1500 User's Guide
400311400	EPSON ActionTower 2000 User's Guide